



Firewood: Our Renewable Resource

by Sarah Smith, Forest Industry Specialist, with input from New Hampshire's firewood dealers

History

As most New Englanders know, history repeats itself. There is a threat of another oil shortage and fuel prices are certainly on the rise. Consumers once again are looking toward our tremendous renewable forest resource as an alternative source for fuel. (*See chart for comparison of oil and wood.*) In the mid 19th Century, wood supplied about 90% of the United States' fuel needs. Fortunately, New Hampshire's forests, covering nearly 90% of the land, have an abundant supply of hardwood trees to supply an increased demand for fuelwood. Only about 26% of the net annual growth of hardwood is harvested (*1986 figures*). Increased utilization can, in fact, benefit our forests by removing low quality trees.

Forest Management

The proper harvesting of firewood from any woodlot requires a carefully thought out, long-term management plan. Landowners should consider what their personal objectives are for removing trees. One or more of the following may apply:

- to improve timber quality
- to enhance wildlife habitat
- to improve the health of the forest
- to provide access roads
- to provide scenic vistas
- to make the stand look better
- to generate income
- to produce a sustained yield of fuelwood

When the demand for fuelwood increases, the removal of low quality trees from a timber stand becomes more economically feasible. This provides an opportunity for the forestry professional to practice timber stand improvement (TSI). TSI removes undesirable low quality trees. The remaining crop trees respond quickly to the increased supply of sunlight, water, and nutrients. Healthy and vigorous trees do more to combat the greenhouse effect than weak or diseased trees. Of course, these positive effects must be carried on by the proper use of efficiently burning woodstoves.

During a timber sale, when sawlogs are removed, the timber harvester may also choose to utilize the small diameter branches for firewood. These tops may ordinarily be left in the woods.

When following well-planned forest management techniques, the harvesting process can encourage regeneration by not only "scuffing up" the forest floor to make a suitable seed bed, but also by allowing more sunlight and rainfall to reach the ground.

In addition to thinning and improving a timber stand, firewood harvesting can enhance wildlife habitat improvement. Openings that are created encourage young succulent plant growth and stump sprouts that provide food for many species of wildlife. Tree tops that are too small for firewood often provide cover for many animals. Openings in the forest encourage *pioneer tree species* (trees that grow only in full sunlight) to become established. These pioneer trees may lead to wildlife diversification by providing a varied food supply and cover where previously there was very little.

Standing dead trees (*snags*) and living trees with cavity openings (*den trees*) are important areas for raising young and escaping the elements for more than 40 species of New Hampshire wildlife. Most notorious of these are the woodpeckers; but many others, such as chickadees, wood ducks, and flying squirrels, rely on them too. When cutting firewood, look for woodpecker holes, chewing around holes produced by damage and decay in the tree, droppings, and other evidence of wildlife use. A careful firewood harvest saves these trees from cutting unless safety problems are encountered.

Use of Firewood

Using firewood requires that the consumer have an understanding of firewood quality, processing, transportation, pricing, and storage. Firewood quality is determined by a number of factors which have to do with the needs and expectations of the consumer. If the consumer is using the firewood to cook in a backyard grill, their needs are very different from someone using the wood to heat their house. Generally, firewood quality is based on the type of wood or species, the moisture content or dryness, and the size of the finished product.

Wood is separated into two major categories, the hardwood species (generally those trees that shed their leaves in the fall) and the softwood or conifer species. Hardwood and softwood are loose terms that don't always describe the actual hardness or softness of a given wood. For example, aspen is a hardwood, but the wood from the aspen tree is actually softer than red pine, a softwood.

All woods burn, some burn better than others and some produce higher heat values per cord. The following chart provides a comparison of the burning qualities of a variety of species.

Seasoning and Storage

Moisture content of wood plays an important role in its use as a fuel. Ideally, firewood ready to burn has a moisture content of approximately 20%. Green or just-cut oak may have a heartwood or center moisture content of up to 80%; therefore, a significant amount of drying must take place before the oak is ready to burn safely and efficiently.

When green wood is burned, much of the combustion is used on evaporating and driving off moisture, and little heat reaches the room during this phase. Wet firewood combined with incomplete combustion and cool chimney surfaces will

cause a build up of *creosote*, a black tar-like substance, on the walls of the flue. Creosote deposits are a major cause of chimney fires since the sticky deposits are extremely flammable at high temperatures.

Unseasoned firewood in combination with an air-tight wood stove is the perfect breeding ground for creosote. Therefore, it's imperative that seasoned firewood be used in an air-tight stove. Also, contact your local fire department

Characteristics of Commonly Burned Woods

SPECIES	SPLITABILITY	EASE of STARTING	HEAVY SMOKE	SPARKS	COALING QUALITIES
Apple	Hard	Hard	No	Few	Excellent
Ash	Medium	Fair	No	Few	Good
Beech	Hard	Hard	No	Few	Excellent
Birch	Medium	Easy	No	Moderate	Good
Cedar	Easy	Easy	Yes	Many	Poor
Cherry	Medium	Hard	No	Few	Excellent
Cottonwood	Easy	Easy	Medium	Moderate	Good
Elm	Hard	Fair	Medium	Few	Good
Hemlock	Hard	Easy	Medium	Many	Poor
Hickory	Medium	Fair	No	Moderate	Excellent
Locust, Black	Hard	Hard	No	Few	Excellent
Maple	Medium	Hard	No	Few	Excellent
Oak	Hard	Hard	No	Few	Excellent
Pine	Easy	Easy	Medium	Moderate	Fair-Poor
Poplar, Yellow	Easy	Easy	Medium	Moderate	Fair
Spruce, Norway	Medium	Easy	Yes	Many	Poor
Sycamore	Medium	Fair	Medium	Few	Good
Tamarack (Larch)	Easy	Easy	Medium	Moderate	Good
Walnut	Medium	Easy	No	Few	Good
Willow	Medium	Easy	No	Moderate	Poor

A mixture of species within a load of firewood is perhaps best. To start a fire, the fast and hot burning species such as aspen, pine, or cedar are ideal. A small amount — not more than 10% of these species within a load may help in kindling fires. While pine and cedar are excellent fire starters, they tend to spark quite a bit and are consumed quickly. To receive a long lasting burn and high heat value, denser woods are preferred. Oak is an ideal long-term burner, but requires an extended period of drying before it's ready to burn. In some cases, depending on location and wood size, the oak firewood may take more than a year to season. Those species in between, such as birch, maple, beech, and ash, may present the best option.

ment to insure that your wood stove is properly installed.

Green firewood that's purchased and stacked during the winter or early spring should be ready for the next heating season. The wood should be stacked in a manner that facilitates good air circulation. By stacking firewood in a sunny location, you can reduce the drying time significantly. As winter approaches, it's beneficial to cover the wood pile. The tarp should only cover the top of the wood, thereby allowing continued airflow throughout the pile. While it may be convenient to stack firewood inside your house, on the porch, or up against a wall, it should only be done when the wood is dry. Remember, many animals enjoy making their homes in firewood piles. In addition, ants may infest them and, consequently, your home.

The size of the firewood is important to most consumers. Obviously, you'll want to purchase firewood that fits easily into your woodstove. Generally, firewood is cut into even increments of 24", 20", 16" or 12". Most firewood dealers are accomodating and will cut to any length, provided they know your needs well in advance. The average width of the individual stick of firewood may also be important to the consumer. Finely split wood is easy to handle, but burns more quickly. Again, discuss your needs with the firewood dealer. Custom work or extra processing will usually command a higher price.

Economics

The trees used to produce firewood represent only a small fraction of the cost of firewood. Those of you who have heard the saying that, "wood warms you twice, once when it's cut and once when it's burned," may not know that it's more like five times. It takes skill and safe operation of expensive equipment to carefully fell trees, limb and top them, skid them out of the woods, buck them up into firewood lengths, split them, load them onto a truck, transport and deliver the cut wood, and, in some cases, stack it for the consumer! The firewood business is labor intensive and requires substantial insurance coverage. The cost of a cord of wood will generally reflect all those steps involved in processing it. A cord of 12" wood requires more handling and processing (and produces more sawdust, which translates into lost volume) than a cord of 24" wood. The 12" wood will therefore demand a higher price per cord. Seasoned, split wood will usually command the highest prices because the firewood dealer must also

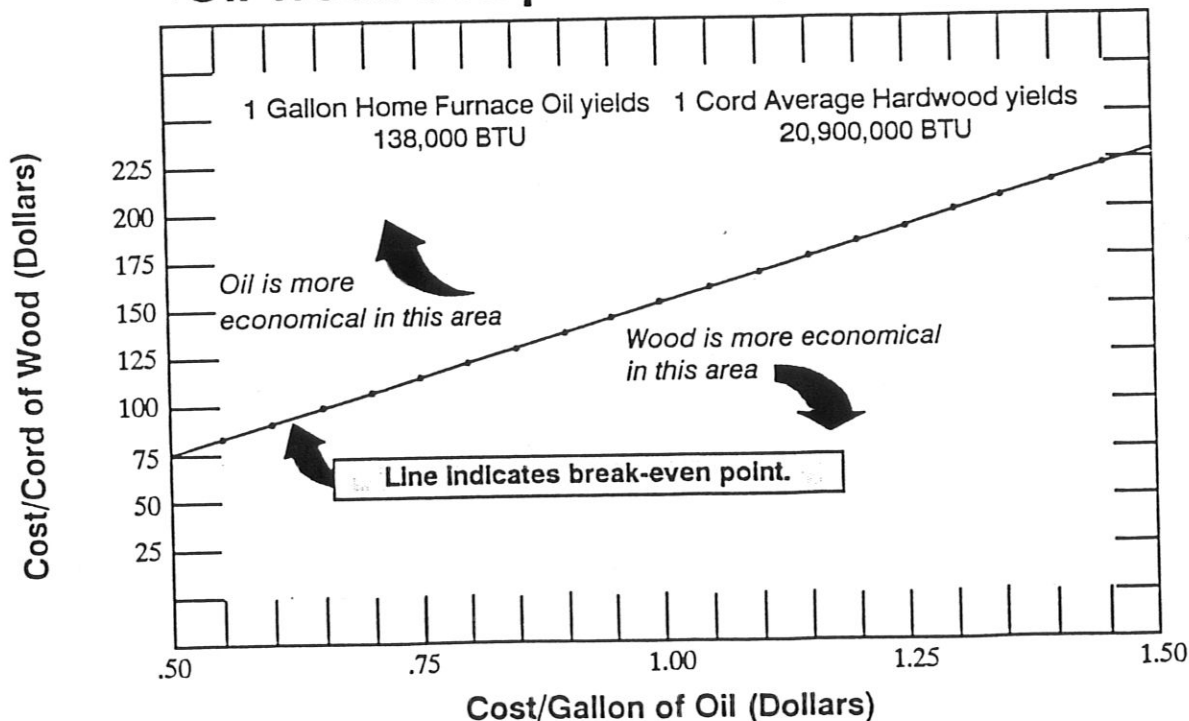
invest in drying time. When comparing prices, ask about quantity discounts.

A cord of wood as defined by New Hampshire law is 128 cubic feet, "ranked and well stowed." The wood dealer will often deliver fractions of a cord. This is allowed under the law as long as it is represented as such. Therefore, the customer may receive a delivery slip that states that the load represents .835 of a cord of 16" wood. These volume figures are usually based on many years of experience of stacking and measuring firewood. The consumer is advised to stack the firewood delivery as soon as possible and to measure the volume. The volume is determined by measuring the length of the pile in feet, multiplying by the width of the pile in feet, and multiplying by the height of the pile in feet. This can also be done in inches with the resulting figure divided by 12. Again, a legal cord will total 128 cubic feet.

It's important to remember that measuring firewood isn't an exact science and that a pile of firewood may stack to a different volume every time — depending on the stacker's methods and tightness of fit. Some variance is to be expected and accepted, though the consumer should be wary of major discrepancies in volume. Most reputable firewood dealers want to know if they've under-delivered so they can make up the difference.

As the temperatures drop in the Northeast, landowners are provided an opportunity to improve their forests. Firewood is only one of the many products derived from a well-managed forest. Professional help is available to landowners to help identify objectives and develop a sound forest management program. Please contact your UNH Cooperative Extension County Office for more information. For your reference, the offices are listed on the back page.

Oil-Wood Comparison in \$/BTU or BTU/\$



UNH Cooperative Extension County Offices

Belknap County

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603-527-5475 Fax: 603-527-5477

Carroll County

75 Main Street, PO Box 860
Ctr. Ossipee, NH 03814-0860
603-539-3331 FAX: 603-539-3335

Cheshire County

800 Park Avenue
Keene, NH 03431-1513
603-352-4550 FAX: 603-358-0494

Coos County

629A Main Street
Lancaster, NH 03584-9612
603-788-4961 FAX: 603-788-3629

Grafton County

Grafton County Courthouse
RR 1, Box 65F
No. Haverhill, NH 03774-9708
603-787-6944 FAX: 603-787-2009#

Hillsborough County

468 Route 13 South
Milford, NH 03055
603-673-2510 FAX: 603-673-0597

Merrimack County

315 Daniel Webster Highway
Boscawen, NH 03303
603-796-2151 or 225-5505 FAX: 603-796-2271

Rockingham County

113 North Road
Brentwood, NH 03833-6623
603-679-5616 FAX: 603-679-8070

Strafford County

259 County Farm Road, Unit 5
Dover, NH 03820-6015
603-749-4445 FAX: 603-743-3431

Sullivan County

24 Main Street
Newport, NH 03773
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